CLAIM(S)

1. A heat recovery ventilator for use in ventilating a room, or the like, comprising:

means for venting a stale airstream of an indoor climate to the outside air;

means for supplying a fresh airstream from the outside air of an outside climate;

at least two stationary regenerative heat exchangers made of a pleated HEPA filter material; and

a rotating air switch for transferring the stale airstream to the regenerative heat exchangers from the means for venting the stale airstream of the indoor climate and for transferring the fresh airstream from the regenerative heat exchangers to the means for supplying the fresh airstream from the outside air of the outside climate, said rotating air switch being rotatably mounted and including:

(a) a first circular side plate having an air flow opening therein,

(b) a second circular side plate having a pair of air flow openings, said second plate spaced apart and disposed opposed and parallel to said first plate, and

(c) a single manifold extending from said air flow opening in said first side plate to one of said pair of said air flow openings in said second side plate, said manifold enclosing said air flow opening in said first side plate and said one of said air flow openings in said second side plate and forming a fresh air passage way for transferring the fresh airstream from the regenerative heat exchangers to the means for supplying the fresh airstream from the outside air of the outside climate, said other opening in said second side plate forming a stale air passageway for transferring the stale airstream from the means for venting the stale airstream of the indoor climate to the regenerative heat exchangers; and wherein air flows in

opposite directions through the same regenerative heat exchanger.

2. The heat recovery ventilator of claim 1, wherein said air switch is isolated from the outside climate by said regenerative heat exchangers.

3. The heat recovery ventilator of claim 1, further comprising a plurality of noncontacting clearance seals, one said noncontacting clearance seal disposed between said first circular plate of said rotating air switch and both the means for venting the stale airstream of the indoor climate and the means for transferring the fresh airstream from the outside air of the outside climate, and said remaining noncontacting clearance seals disposed between said second circular plate and said stationary regenerative heat exchangers.

4. The heat recovery ventilator of claim 1, further comprising four regenerative heat exchangers.

5. The heat recovery ventilator of claim 1, wherein said pleated HEPA filter material has a pleat density of 6 pleats per inch.

6. The heat recovery ventilator of claim 1, wherein said HEPA filter material captures at least 99.97% of particles having a diameter greater than 0.3 microns.

7. The heat recovery ventilator of claim 1, wherein said HEPA filter material is rated at least 85% Dust-Spot Efficiency percentage as measured by ASHRAE Standard 52.1-1992, Dust-Spot Procedure.

8. A heat recovery ventilator for use in a room or the like, comprising a housing, two blowers, at least two stationary regenerative

heat exchangers made of a pleated HEPA filter material, a shaft, a single rotating air switch mounted on said shaft, a motor for driving said blowers and said shaft, one of said blowers for forcing a stale airstream out of the room; the other of said blowers for forcing a fresh airstream into the room, said air switch, in use, alternately imparting the stale airstream from one said blower to a regenerative heat exchanger, then imparting the fresh airstream to that same heat exchanger and through said other blower, when said air switch rotates in a 180° turn.

9. The heat recovery ventilator of claim 8, wherein said rotating air switch has:

(a) a first side plate having an opening and having a center shaft aperture,

(b) a second side plate having two openings spaced from each other, and a center shaft aperture,

(c) a single manifold extending from said first side plate to said second side plate, wherein said manifold connects said opening of said first side plate with one of said openings in said second side plate forming a fresh air passageway, and

(d) a shaft receiving portion extending from said first side plate to said second side plate;

wherein said rotating switch is disposed upon said shaft, said shaft disposed in said shaft receiving portion, and wherein, in use, the fresh airstream flows from said regenerative heat exchangers through said fresh air passageway and is forced out by said other blower, and wherein said other opening of said second side plate along with a portion of the manifold and a portion of the shaft receiving portion form a stale air passageway from said one blower to said regenerative heat exchangers, for transferring the stale airstream to said regenerative heat exchangers.

10. The heat recovery ventilator of claim 8, wherein said housing has:

(a) first compartment containing said one blower, said first compartment having a plurality of openings therein for forcing the stale airstream to flow into said housing and through said one blower,

(b) a second compartment containing said other blower and said motor, said second compartment having a plurality of openings therein for permitting the fresh airstream to exit the housing and to enter the room,

(c) a third compartment containing said rotating air switch, and

(d) a fourth compartment containing said regenerative heat exchangers, said fourth compartment having a plurality of openings therein for forcing the stale airstream out of said fourth compartment and for allowing the fresh airstream to be drawn into said fourth compartment.

11. The heat recovery ventilator of claim 10, wherein

(a) said first compartment is next to said second compartment and shares a common blower bulkhead,

(b) said third compartment is adjacent to both said first compartment and said second compartment and shares a common motor bulkhead with said first compartment and said second compartment, said motor bulkhead having a first opening into said first compartment and a second opening into said second compartment, and

(c) said fourth compartment is spaced from said first and second compartments and is adjacent to said third compartment, said fourth compartment sharing a common regenerator bulkhead with said third compartment, said regenerator bulkhead having an opening therein, said rotating air switch disposed in said

third compartment with one end of said rotating air switch adjacent the opening in the regenerator bulkhead and the other end of said rotating air switch adjacent to the opening in the motor bulkhead between the second and third compartments.

12. The heat recovery ventilator of claim 6, wherein said HEPA filter material captures at least 99.97% of particles having a diameter greater than 0.3 microns.

13. The heat recovery ventilator of claim 6, wherein said HEPA filter material is rated at least 85% Dust-Spot Efficiency percentage as measured by ASHRAE Standard 52.1-1992, Dust-Spot Procedure.

14. A method of providing indoor ventilation, air filtration and source control using a heat recovery ventilator having stationary rectangular regenerative heat exchangers, a manifold for accepting the stationary rectangular regenerative heat exchangers, two blowers, one rotating air switch, a motor for driving the blower and air switch, all disposed in a housing, the housing having stale air openings for allowing a stale airstream to enter the housing and fresh air openings for allowing filtered fresh air to exit from said housing; the method comprising the steps of:

(a) selecting the rectangular regenerative heat exchangers made of a pleated HEPA filter material;

(b) disposing said stationary rectangular regenerative heat exchangers in the manifold;

(c) forcing a stale airstream from an indoor climate into the housing,

(d) blowing the stale airstream into the rotating air switch,

(e) transporting the stale airstream from the rotating air switch into the stationary rectangular regenerative heat exchangers,

(f) simultaneously exchanging heat and moisture from the stale airstream onto the regenerative heat exchangers, filtering the stale air stream, and forcing the filtered stale airstream to flow out of the housing,

(g) forcing a fresh air stream into the housing and through the same regenerative heat exchangers,

(h) exchanging heat and moisture on the regenerative heat exchangers into the fresh airstream and simultaneously filtering the fresh airstream,

(i) forcing the filtered fresh airstream, which is heated and moisturized, into the rotating air switch and through the fresh air blower, and

(j) forcing the filtered fresh airstream, which is heated and moisturized, out of the housing and into the indoor climate.

15. The method of claim 14, wherein the rotating air switch includes:

(a) a first side plate having an opening and having a center shaft aperture,

(b) a second side plate having two openings spaced from each other, and a center shaft aperture,

(c) a shaft receiving portion extending from said first side plate to said second side plate and connecting said center shaft apertures,

(d) a single manifold extending from said first side plate to said second side plate, said manifold connecting said opening of said first side plate with one of said openings in said second side plate and forming a fresh air passageway there between, said other of said openings of said second side plate along with a portion of said manifold and a portion of said shaft

receiving portion forming a stale air passageway from said first blower to said regenerative heat exchanger,

and wherein the method further comprises in step (d) blowing the stale airstream into the stale air passageway, in step (e) transporting the stale airstream from the stale air passageway in the rotating air switch into the stationary regenerative heat exchangers, and in step (i) forcing the filtered fresh airstream into the fresh air passageway in the rotating air switch and through the fresh air blower.

16. The method of claim 14, wherein said step of selecting said regenerative heat exchangers made of said HEPA filter material includes selecting said HEPA filter material which captures at least 99.97% of particles having a diameter greater than 0.3 microns.

17. The method of claim 14, wherein said step of selecting said regenerative heat exchangers made of said HEPA filter material includes selecting HEPA filter material rated at least 85% Dust-Spot Efficiency percentage as measured by ASHRAE Standard 52.1-1992, Dust-Spot Procedure.

18. A method of providing indoor ventillation, air filtration and air pollution source control using a heat recovery ventilator having means for venting a stale airstream of an indoor climate to the outside air, means for supplying a fresh airstream from the outside air of an outside climate, and a regenerative heat exchanger, the method comprising the steps of :

(a) selecting a regenerative heat exchanger of a pleated HEPA filter material;

(b) positioning said regenerative heat exchanger in a stationary position to intercept a fresh air stream and to intercept a stale air stream;

(c) venting the stale airstream from an indoor climate into the ventilator and into said regenerative heat exchanger with the means for venting the stale airstream of an indoor climate to the outside air;

(d) simultaneously exchanging heat and moisture from the stale airstream onto said regenerative heat exchanger, filtering the stale air stream, and forcing the filtered stale airstream to flow out of the ventilator,

(e) supplying fresh air into the ventilator and through the same regenerative heat exchanger with the means for supplying the fresh air stream from the outside air of an outside climate,

(f) exchanging heat and moisture on the regenerative heat exchanger into the fresh airstream and simultaneously filtering the fresh airstream, and

(g) forcing the fresh filtered airstream, which is heated and moisturized, out of the ventilator and into the indoor climate.

19. The method of claim 18, wherein said selecting step includes selecting said regenerative heat exchanger of said pleated HEPA filter material wherein said HEPA filter material captures at least 99.97% of particles having a diameter greater than 0.3 microns.

20. The method of claim 18, wherein said selecting step includes selecting said regenerative heat exchanger of said pleated HEPA filter material wherein said HEPA filter material is rated at least 85% Dust-Spot Efficiency percentage as measured by ASHRAE Standard 52.1-1992, Dust-Spot Procedure.

21. A convertible device which converts between a heat recovery ventilator providing filtered, heat and moisture conditioned air and an air

filtration device providing filtered air alone, said convertible device comprising:

means for venting a stale airstream of an indoor climate to the outside air;

means for supplying a fresh airstream from the outside air of an outside climate;

at least two stationary regenerative heat exchangers made of a pleated HEPA filter material;

an air switch for transferring the stale airstream to the regenerative heat exchangers from the means for venting the stale airstream of the indoor climate and for transferring the fresh airstream from the regenerative heat exchangers to the means for supplying the fresh airstream from the outside air of the outside climate, said air switch being rotatably mounted; and

means for controlling rotation of the air switch between a stationary and a rotating configuration;

wherein, said air switch is rotated when said convertible device is operated as a heat recovery ventilator providing filtered, heat and moisture conditioned air and wherein said air switch remains stationary when said convertible device is operated as an air filtration device providing filtered air alone.

22. The heat convertible device of claim 21 , wherein said HEPA filter material captures at least 99.97% of particles having a diameter greater than 0.3 microns.

23. The heat convertible device of claim 21, wherein said HEPA filter material is rated at least 85% Dust-Spot Efficiency percentage as measured by ASHRAE Standard 52.1-1992, Dust-Spot Procedure.

24. A heat recovery ventilator for use in ventilating a room, or the like, comprising means for venting a stale airstream of an indoor climate to the outside air, means for supplying a fresh airstream from the outside air of an outside climate, at least two stationary regenerative heat exchangers and a rotating air switch for transferring the stale airstream to the regenerative heat exchangers from the means for venting the stale airstream of the indoor climate and for transferring the fresh airstream from the regenerative heat exchangers to the means for supplying the fresh airstream from the outside air of the outside climate, said rotating air switch being rotatably mounted and including:

(a) a first circular side plate having an air flow opening therein,

(b) a second circular side plate having a pair of air flow openings, said second plate spaced apart and disposed opposed and parallel to said first plate, and

(c) a single manifold extending from said air flow opening in said first side plate to one of said pair of said air flow openings in said second side plate, said manifold enclosing said air flow opening in said first side plate and said one of said air flow openings in said second side plate and forming a fresh air passage way for transferring the fresh airstream from the regenerative heat exchangers to the means for supplying the fresh airstream from the outside air of the outside climate, said other opening in said second side plate forming a stale air passageway for transferring the stale airstream from the means for venting the stale airstream of the indoor climate to the regenerative heat exchangers; and wherein air flows in opposite directions through the same regenerative heat exchanger.